U.S. Coast Guard Navigation Center
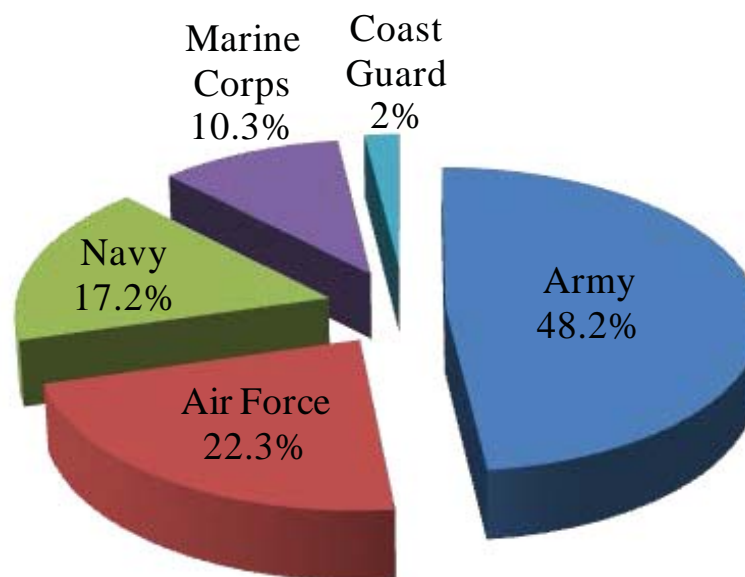
NAVCEN
Overview

Homeland
Security

U.S. Department of
Homeland Security
**United States
Coast Guard**

Personnel Strength of Armed Forces

Service	Military personnel	Percent of total
Army	1,042,200	48.2%
Air Force	483,000	22.3%
Navy	370,900	17.2%
Marine Corps	223,300	10.3%
Coast Guard	43,604	2.0%
Total	2,163,004	100%

Active duty and Reserve
Source for Department of Defense (DOD)– FY15
Defense Manpower Requirements Report

Marine Corps 10.3%
Coast Guard 2%
Navy 17.2%
Army 48.2%
Air Force 22.3%

Homeland Security

U.S. Department of
Homeland Security
**United States
Coast Guard**

US Coast Guard's Missions

By law, the US Coast Guard has 11 Missions:

- Marine Safety
- Aids to Navigation
- Ports, Waterways, and Coastal Security
- Search and Rescue
- Marine Environmental Protection
- Living Marine Resources
- Other Law Enforcement
- Drug Interdiction
- Defense Readiness
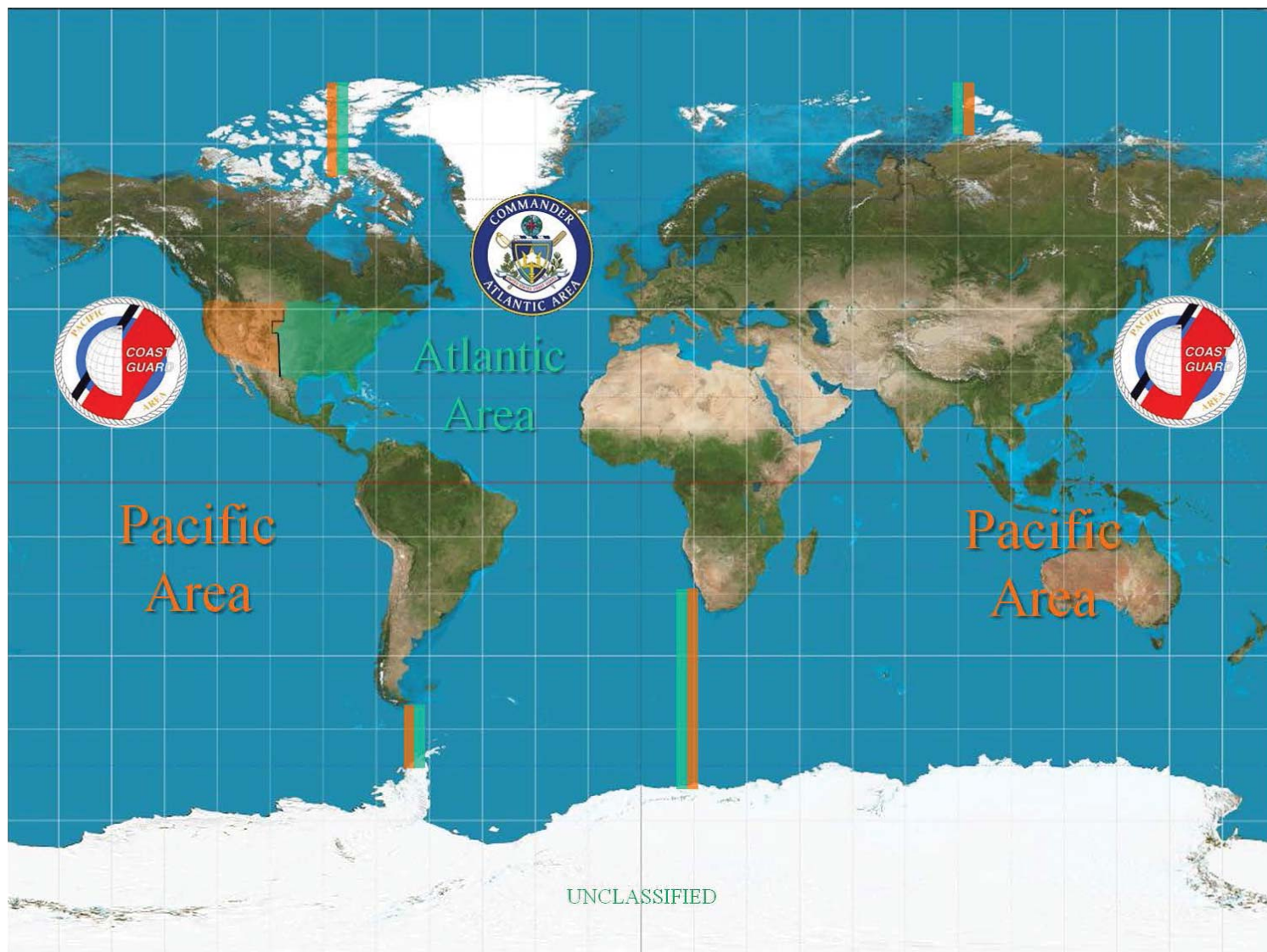- Migrant Interdiction
- Ice Operations

Homeland Security

U.S. Department of Homeland Security
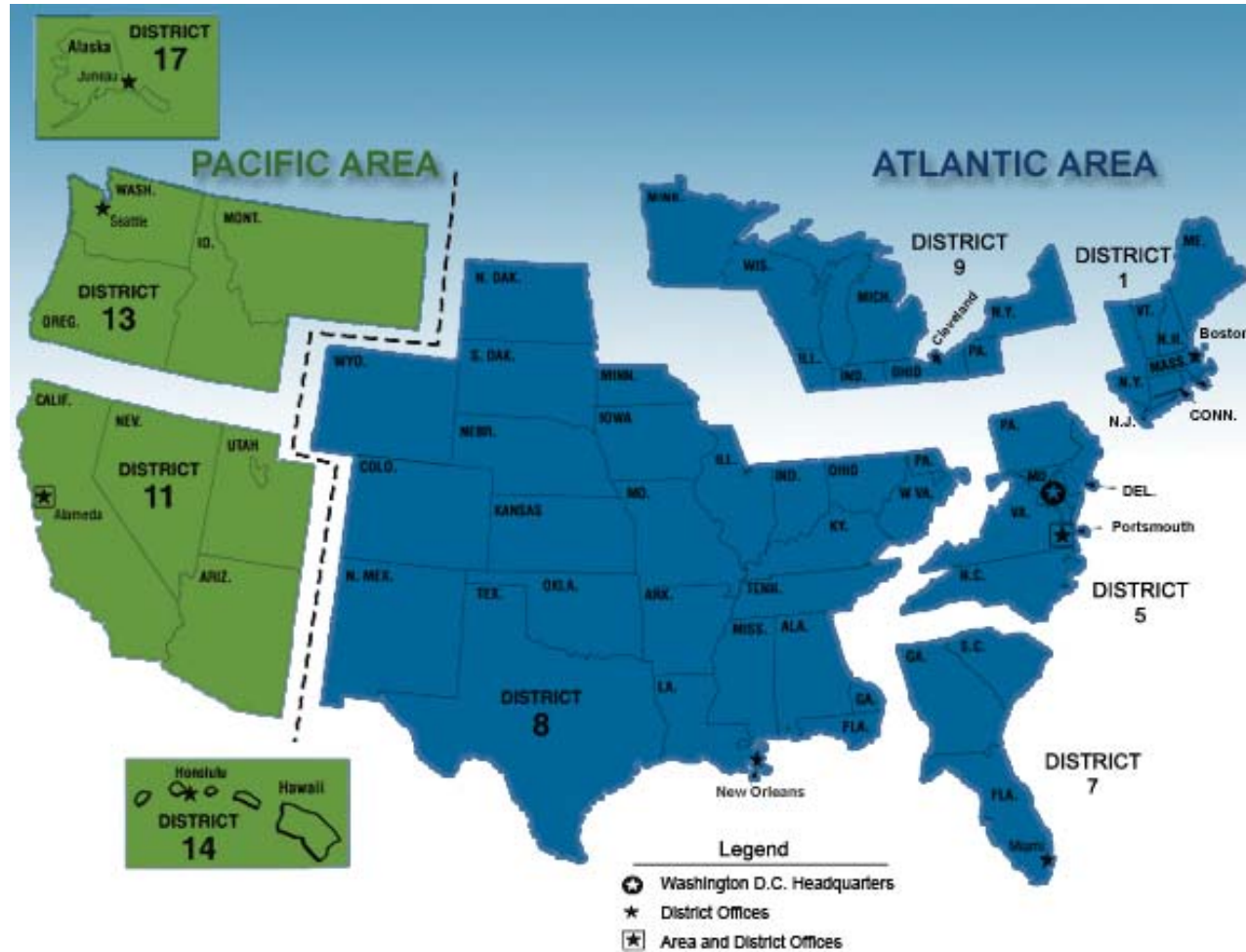**United States Coast Guard**

USCG Atlantic and Pacific Commands

USCG District Structure

USCG Sector Commands

Sector Seattle
Sector Upper Mississippi River
Sector Lake Michigan
Sector Sault Ste Marie
Sector Buffalo
Sector New York
Sector Northern New England
Sector Portland
Sector Detroit
Sector Boston
Sector San Francisco
Sector Southeastern New England
Sector Long Island
Sector Los Angeles-Long Beach
Sector Delaware Bay
Sector Baltimore
Sector San Diego
Sector Hampton Roads
Sector Ohio Valley
Sector North Carolina
Sector Lower Mississippi
Sector Charleston
Sector Houston-Galveston
Sector Miami
Sector Jacksonville
Sector Corpus Christi
Sector New Orleans
Sector Mobile
Sector St Petersburg
Sector Key West

Command Boundaries

— Area Boundary
— District Boundary
— Economic Exclusion Zone

Sector Guam
Sector Honolulu
Sector Anchorage
Sector Juneau
Sector San Juan

v6.0

Homeland Security

U.S. Department of Homeland Security
United States Coast Guard

NAVCEN Mission Statement

The Navigation Center provides services to enhance the safety, security, and efficiency of U.S. waterways, and respond to the needs of civil Global Positioning System (GPS) users. These services include:

- Operating the Nationwide Differential GPS (DGPS) System

- Operating the Long Range Identification and Tracking (LRIT) business helpdesk

- Operating the Nationwide Automatic Identification System (NAIS)

- Publishing Notices to Mariners and the Light List

- Managing the US Aids to Navigation Information Management System

- Managing electronic charting portfolios for U.S. Coast Guard units

- Serving as the primary U.S. government interface with GPS users (except aviation and DOD)

- Receiving and coordinating investigation of GPS outage reports

- Disseminating navigation information through 24/7 operations center and the NAVCEN website

Nationwide Differential GPS (NDGPS)

System Description

- 83 Nationwide Remote Broadcast Sites throughout the United States and territories
  - System in operation since 1996
  - 92% nationwide signal coverage
  - Better than 10 meter accuracy
  - 10 second integrity alarm to the user
  - Satisfies Harbor/Harbor Approach requirements
  - 99.7% availability requirement
  - 99.9% availability requirement for Vessel Traffic Service (VTS)
  - Sites equipped with out-of-tolerance user alerting

Nationwide DGPS Coverage
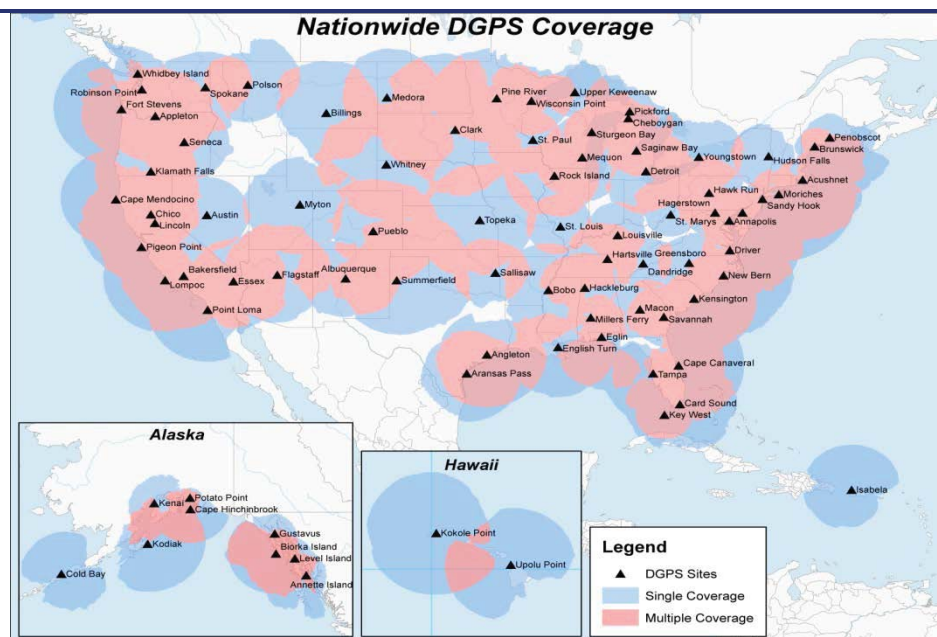
Operations

- Redundant equipment at sites
- Redundant control stations at NAVCEN

Stakeholders

- U.S. Army Corps of Engineers (USACE)
- Department of Transportation (DOT)
- National Oceanic & Atmospheric Administration (NOAA):
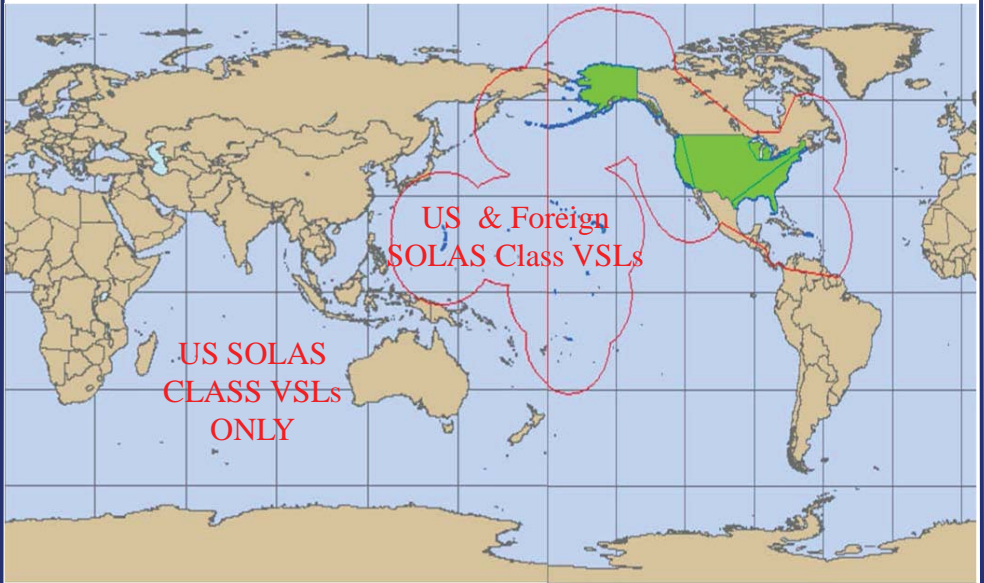 - Continuously Operating Reference Stations (CORS) network

Long Range Identification & Tracking (LRIT)

System Description

- Assist U.S. flagged ships subject to Safety of Life at Sea (SOLAS) regulation
- Uses existing INMARSAT/Iridium equipment
- Track U.S. SOLAS ships worldwide
- Track inbound vessels on Int'l voyages, or traveling within 1,000 NM of the U.S. that are:
  - Passenger ships, 300+ GT cargo ships, or self-propelled offshore drill unit, not on site
  - Available for search and rescue surface picture and maritime domain awareness

US & Foreign SOLAS Class VSLs

US SOLAS CLASS VSLs ONLY

Operations

- Around the clock watch to provide assistance
- Conformance testing
- Verification of vessel reporting (4x/day)
- Currently track 700+ U.S. vessels worldwide
- Track over 7,000 vessels within the U.S. border

Stakeholders

- Over 100 countries participate in LRIT
- Pole Star (Private Contractor Data Management)
- Internally used within the Coast Guard to serve as:
  - Search and Rescue
  - Harbor Approach Early Notification

Homeland Security

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United States Coast Guard

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Nationwide Automatic Identification System (NAIS)

System Description

- Track vessels transiting throughout the NAIS areas
- Support coordinated information sharing with U.S. organizations and port partners
- 50 NM receive range, 24 NM transmit range
  - Interim Receive – Operate
  - Permanent Transceive System – Operate
  - Includes VTS AIS Transceiver - Only monitor
  - Marine Exchange Alaska – Only monitor

AIS Target List
&
AIS data from Tug TEXAN
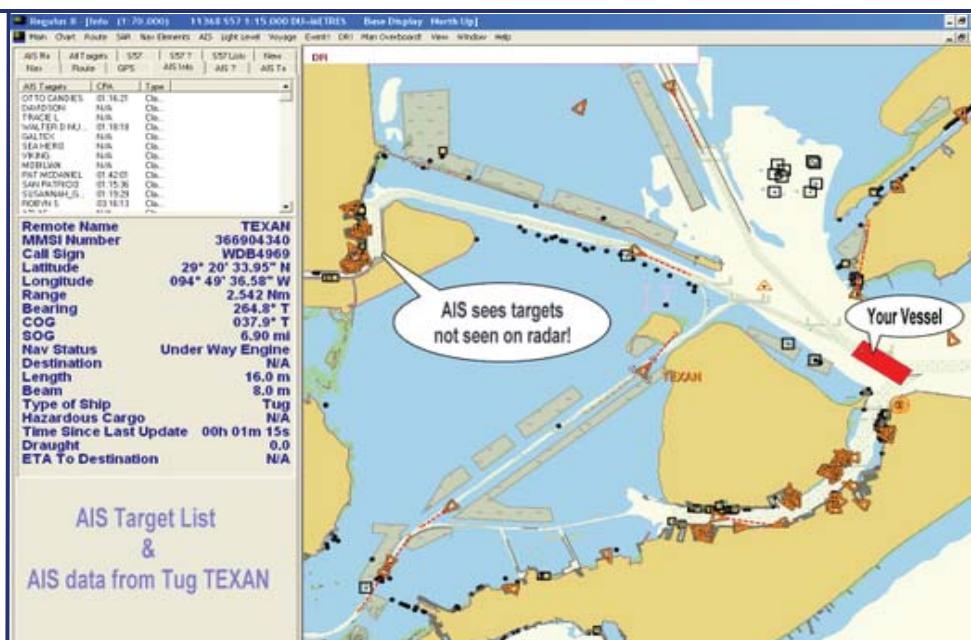
Operations

- Around the clock monitoring the performance of the NAIS sites
- Remote troubleshooting
- Monitor data connection to users

Stakeholders

- Bidirectional data sharing with Canada in the St. Lawrence Seaway
- Partnerships with U.S. Departments of Defense (DOD), Transportation (DOT), Homeland Security (DHS), and Commerce (DOC)
- U.S. Coast Guard operational units

Local Notice to Mariners (LNM)

System Description	
- A region based method by which the public is informed of changes to aids to navigation - LMSs are a carriage requirement onboard all commercial vessels - NAVCEN website is the single authoritative source for LNMs and the chart corrections contained therein, as well as Light Lists	

Operations	Stakeholders
- U.S. Coast Guard Districts create LNM - LNMs distributed via NAVCEN Website (33 CFR 72.01-5) - Users subscribe to a list server for notification that the NAVCEN website is updated	- Service to all mariners who navigate the waters of the United States - National Oceanic and Atmospheric Administration (NOAA) - National Geospatial-Intelligence Agency (NGA)

Homeland Security

US Aids to Navigation Information Management System (USAIMS)

System Description

- USAIMS is the official electronic record of USCG and private Aids to Navigation (ATON)

- NAVCEN supports District Prevention Department Waterway Management staffs (dpw) and ATON Units with application support (e.g., special queries, tutorials, document system change requests)

- Automate production of weekly and annual Light List for NAVCEN website

- Produce print files for the annual version of the Light List

Operations

- Produce annual Light List for NAVCEN website and printing

- Produce weekly Light List updates (PDF and XML) for NAVCEN website

- Manage updates and maintenance of the system, perform system testing and training

Stakeholders

- Service to all mariners who navigate the waters of the United States

- CG ATON Units

- District Waterways
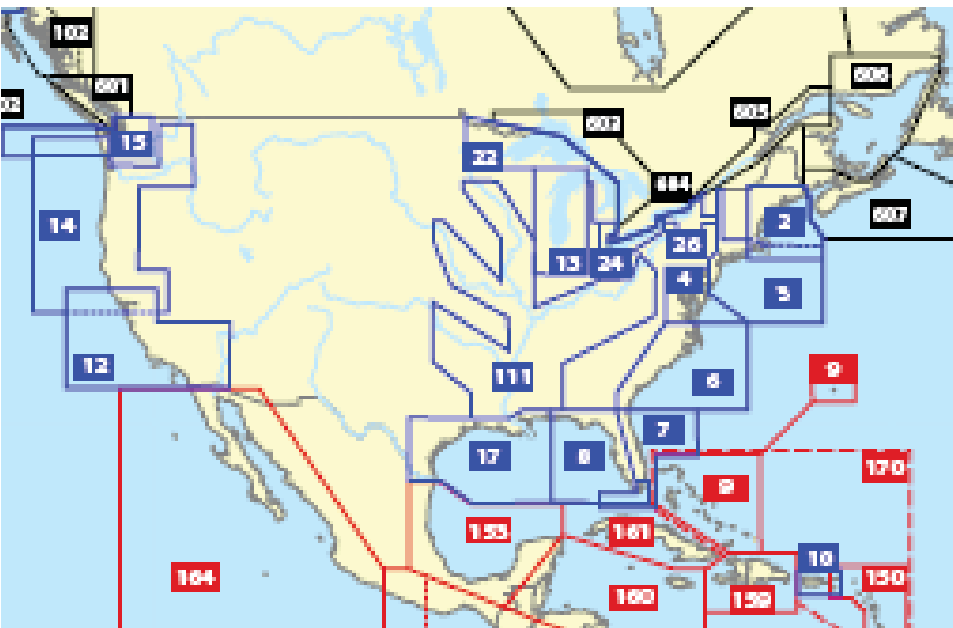
Electronic Chart Portfolio Management

System Description

- USCG Electronic Chart Portfolio Manager

- Provide electronic charts to the USCG cutter fleet and boat forces

- Provide help desk service, Electronic Chart Display and Information System (ECDIS) lab

- Electronic charts covering U.S., Caribbean, Mesoamerican waters, and other select areas

- Cover 321 cutters/boats (49'+) and 1190 boats

Operations

- Subject matter experts on policy and acquisitions for electronic charts

- Liaison with NOAA, NGA, and USACE for charting and maritime information

Stakeholders

International and national agencies

- National Oceanic and Atmospheric Administration (NOAA)

- National Geospatial-Intelligence Agency (NGA)

- U.S. Army Corps of Engineers (USACE)

Electronic Tracking (E-Tracking)

System Description

Data Management Processes:

- Commercial AIS error notification
- CG and Port Partner AIS error notification
- NAIS historical and live data request processing

MIOC application support:

- LRIT Business Help Desk (BHD) application administration
- System Operation Center (SOC) tool administration

NAIS infrastructure analysis:

- Monitor and troubleshoot system performance criteria
- Technical liaison to system sponsor and Product Line
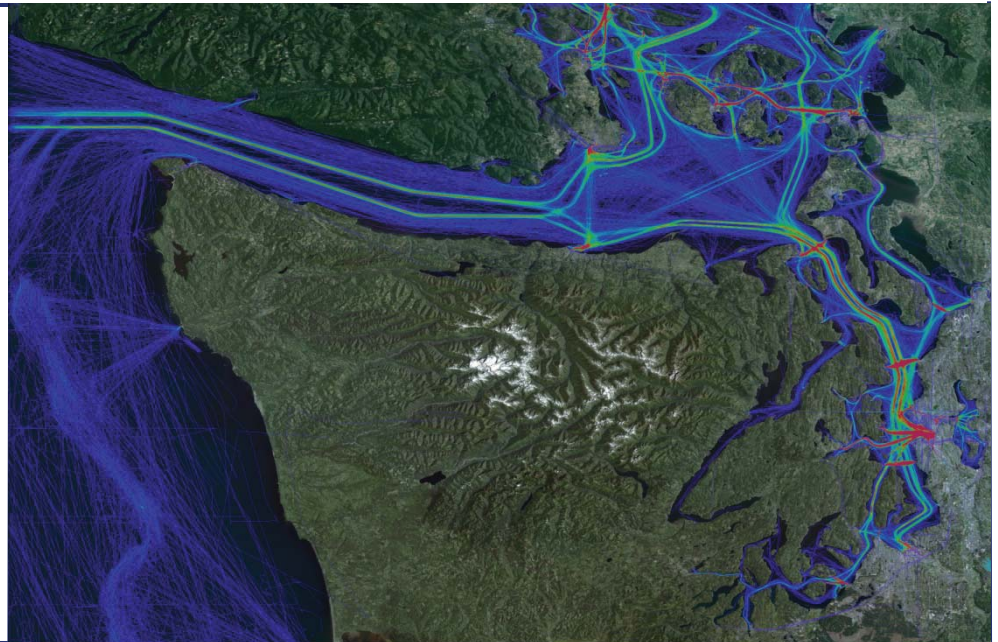
Key Outcomes

- NAIS meets functional and operational requirements
- International Maritime Organization (IMO) vessel assistance and notification of AIS infractions
- CG assets meet AIS requirements
- NAIS data product delivered to customers

Stakeholders

- All USCG Program Offices
- OGAs (Internal Revenue Service (IRS), Department of Justice (DOJ), Department of Defense (DOD), Customs and Border Patrol (CBP))
- Civilian Legal Offices, Port Partners, Educational Institutions
- Freedom of Information Act (FOIA)

Homeland Security

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United States Coast Guard

Navigation Information Service (NIS)

System Description

- Primary interface to disseminate information on GPS, DGPS, AIS, NAIS, LRIT Maritime Safety, Maritime Communications, Maritime Regulations & Local Notice to Mariners

- Over 275,000 hits monthly on the NAVCEN website

- 21,000+ List Server subscribers for GPS status, GPS advisories, and LNMs

- Coordinate Civilian GPS Interference detection and mitigation response

- Civil interface for non-aviation GPS users

Operations

- Around the clock NAVCEN point of contact for maritime and civil GPS users

- Main dissemination point of information for NAVCEN

- GPS testing coordination

Stakeholders

- General Public
- Maritime and public entities include:
  - Maritime users
  - Civil GPS users
  - Other non-Department of Defense (DOD) users

Navigation Information Service (NIS) Inquiries
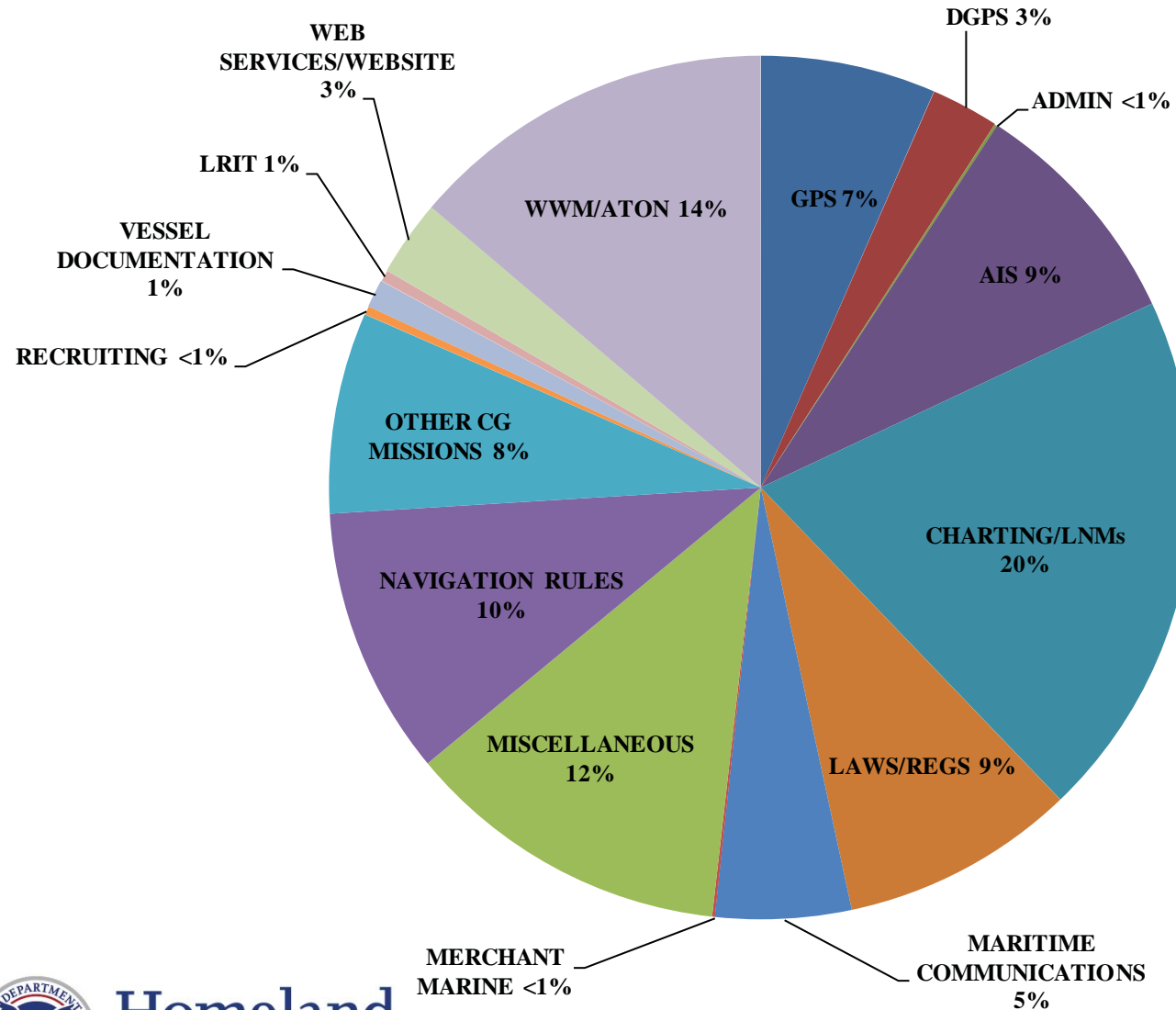
944 Total Inquiries in 2015

Pie chart segments:
- DGPS 3%
- ADMIN <1%
- GPS 7%
- AIS 9%
- CHARTING/LNMs 20%
- LAWS/REGS 9%
- MARITIME COMMUNICATIONS 5%
- MERCHANT MARINE <1%
- MISCELLANEOUS 12%
- NAVIGATION RULES 10%
- OTHER CG MISSIONS 8%
- RECRUITING <1%
- VESSEL DOCUMENTATION 1%
- LRIT 1%
- WEB SERVICES/WEBSITE 3%
- WWM/ATON 14%

Homeland Security

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United States Coast Guard

Operational Civil Interface Duties

Description	
• 1986 – GPS became a dual-use (Military/Civil) system, DOD formed an MOU with DOT for GPS Civil Interface • Civil GPS Service Interface Committee (CGSIC) was formed as liaison between world's civil GPS users and U.S. GPS authorities • DOT assigned operational interface to U.S. Coast Guard for dissemination of GPS operational information , CG retained responsibility after shifting to DHS	

Operations	Stakeholders
• CGSIC Deputy Chair and Executive Secretariat • Publish GPS operational files for public use • Accept and process GPS inquiries and problem/ interference reports • Advocate for the civil GPS community	• U.S. Air Force GPS Operations Center (GPSOC) • FAA National Operations Control Center (NOCC) • Other agencies of the U.S. government for response to inquiries • Civil, non-aviation users

Civil GPS Services Interface Committee (CGSIC)

Description

- 1989 – DOT Takes Lead for Civil Users

- 1991 – Civil GPS User Interface Committee (CGSIC):

  o Chair (DOT/Research and Innovative Technology Administration)

  o Deputy Chair (CO NAVCEN)

  o Executive Secretariat (NAVCEN Staff)

  o Liaison for world's Civil GPS Users

CGSIC Plenary Session, Tampa, Florida, 14-15 September 2015

International Sub-committee held in Kyoto, Japan, Nov 2015
Survey, Mapping & Geo-Sciences held in Portland, OR, Nov 2015

Operations

- CGSIC Provides:
  o Technical information exchange with civil GPS users
  o Identify type of information & distribution methods
  o Identify Issues for resolution by U.S. GPS Authorities
  o Conduct GPS information studies on civil user needs
  o Advocate for civil use of GPS

Stakeholders

Subcommittees

- Survey, Mapping & Geo-Sciences

- Timing

- U.S. States & Local Government

- International Information

Advisors

- Land

- Aviation

- Marine

- GPS Industry Council

Homeland Security

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United States Coast Guard

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GPS Information Sharing & Interference Detection and Mitigation (IDM)

System Description	
• 2014 Interagency GPS User Support MOA • Trilateral-agency User Segment Representation • Multi-agency IDM Coordination • Implement GPS MOA • Maintain Trilateral Representation • Multi-agency IDM Coordination in Annex • Designated by USCG as GPS testing focal point for all GPS band testing and Other Government Agency (OGA) testing events	**USAF** GPSOC (military) **USCG**　　　　　　　　　　**FAA** NAVCEN　　　　　　　　　　SOG (surface)　　　　　　　　　(airspace)
Operations	**Stakeholders**
• Support Civil Mission Planning and User Requirements • Provide Satellite Constellation Status • Provide User Advisories • Coordinate GPS Testing • Process GPS Disruption Reports • Interface Control Document Review and Coordination • GPS related Committees and Working Groups	U.S. Air Force GPS Ops Center (GPSOC) FAA Satellite Operations Group (SOG) FAA Air Traffic Control System Command Center (ATCSCC) U.S. Coast Guard Navigation Center (NAVCEN) Federal Communications Commission Ops Center (FCCOC) DHS National Coordinating Center for Telecomms (NCC)

www.navcen.uscg.gov

The primary means of information dissemination used by the NIS is the NAVCEN Website. It is the focal point of all NAVCEN data regarding GPS, DGPS, NAV Rules, NAIS, LRIT and much more.

U.S. Coast Guard Navigation Center

NAVCEN Federal Partners

NAVIGATION CENTER'S FEDERAL PARTNERS

DEPARTMENT OF STATE	DEPARTMENT OF TRANSPORTATION	DEPARTMENT OF HOMELAND SECURITY	DEPARTMENT OF DEFENSE	DEPARTMENT OF COMMERCE

DEPARTMENT OF TRANSPORTATION
- FEDERAL HIGHWAY ADMINISTRATION
- RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION (RITA)
- FEDERAL AVIATION ADMINISTRATION (FAA)

DEPARTMENT OF HOMELAND SECURITY
- COAST GUARD HEADQUARTERS
  - ATLANTIC / PACIFIC AREA COMMANDS
- NATIONAL CYBERSECURITY & COMMUNICATIONS INTEGRATION CENTER

DEPARTMENT OF DEFENSE
- AIR FORCE
- ARMY
- NAVY
- NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY (NGA)

DEPARTMENT OF COMMERCE
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

Bottom-level entities:
- BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS (OES)
- OFFICE OF OPERATIONS, RESEARCH AND DEVELOPMENT
- NATIONAL TRANSPORTATION SYSTEMS CENTER (VOLPE)
- OFFICE OF POSITION, NAVIGATION AND TIMING (PNT)
- NATIONAL OPERATION COMMAND CENTER (NOCC)
- AIR TRAFFIC CONTROL SYSTEMS COMMAND CENTER (ATCSCC)
- NAVIGATION CENTER (NAVCEN)
- DHS NATIONAL COORDINATION CENTER (NCC)
- GPS OPERATIONS CENTER (GPSOC)
- US ARMY CORPS OF ENGINEERS (USACE)
- NAVAL RESEARCH LABORATORY
- MARITIME SAFETY OFFICE (SH)
- OFFICE OF COAST SURVEY
- NATIONAL GEODETIC SURVEY (NGS)
- OFFICE OF RESPONSE AND RESTORATION (ERMA APPLICATION)

USCG NAVIGATION CENTER MISSIONS
- DIFFERENTIAL GPS
- LONG RANGE IDENTIFICATION & TRACKING (LRIT)
- NATIONWIDE AUTOMATIC IDENTIFICATION SYSTEM (NAIS)
- NOTICE TO MARINERS AND LIGHT LISTS
- e-CHARTING
- U.S. GOVERNMENT INTERFACE FOR GPS (CIVILIAN LAND AND MARITIME USERS)
- INTERFERENCE DETECTION AND MITIGATION (IDM)

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United States Coast Guard

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USCG NAVIGATION CENTER MISSIONS

| DIFFERENTIAL GPS | LONG RANGE IDENTIFICATION & TRACKING (LRIT) | NATIONWIDE AUTOMATIC IDENTIFICATION SYSTEM (NAIS) | NOTICE TO MARINERS AND LIGHT LISTS | e-CHARTING | U.S. GOVERNMENT INTERFACE FOR GPS (CIVILIAN LAND AND MARITIME USERS) | INTERFERENCE DETECTION AND MITIGATION (IDM) |

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NAVIGATION CENTER'S FEDERAL PARTNERS

DEPARTMENT OF STATE
- BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS (OES)

DEPARTMENT OF TRANSPORTATION
- FEDERAL HIGHWAY ADMINISTRATION → OFFICE OF OPERATIONS, RESEARCH AND DEVELOPMENT
- RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION (RITA) → NATIONAL TRANSPORTATION SYSTEMS CENTER (VOLPE), OFFICE OF POSITION, NAVIGATION AND TIMING (PNT)
- FEDERAL AVIATION ADMINISTRATION (FAA) → NATIONAL OPERATION COMMAND CENTER (NOCC), AIR TRAFFIC CONTROL SYSTEMS COMMAND CENTER (ATCSCC)

DEPARTMENT OF HOMELAND SECURITY
- COAST GUARD HEADQUARTERS → ATLANTIC / PACIFIC AREA COMMANDS → NAVIGATION CENTER (NAVCEN)
- NATIONAL CYBERSECURITY & COMMUNICATIONS INTEGRATION CENTER → DHS NATIONAL COORDINATION CENTER (NCC)

DEPARTMENT OF DEFENSE
- AIR FORCE → GPS OPERATIONS CENTER (GPSOC)
- ARMY → US ARMY CORPS OF ENGINEERS (USACE)
- NAVY → NAVAL RESEARCH LABORATORY
- NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY (NGA) → MARITIME SAFETY OFFICE (SH)

DEPARTMENT OF COMMERCE
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) → OFFICE OF COAST SURVEY, NATIONAL GEODETIC SURVEY (NGS), OFFICE OF RESPONSE AND RESTORATION (ERMA APPLICATION)

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- INTERFERENCE DETECTION AND MITIGATION (IDM)
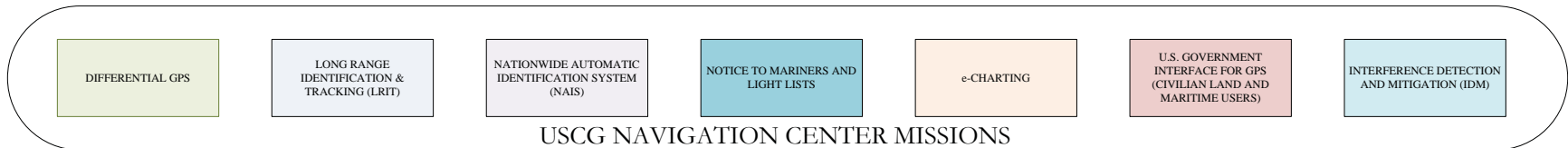
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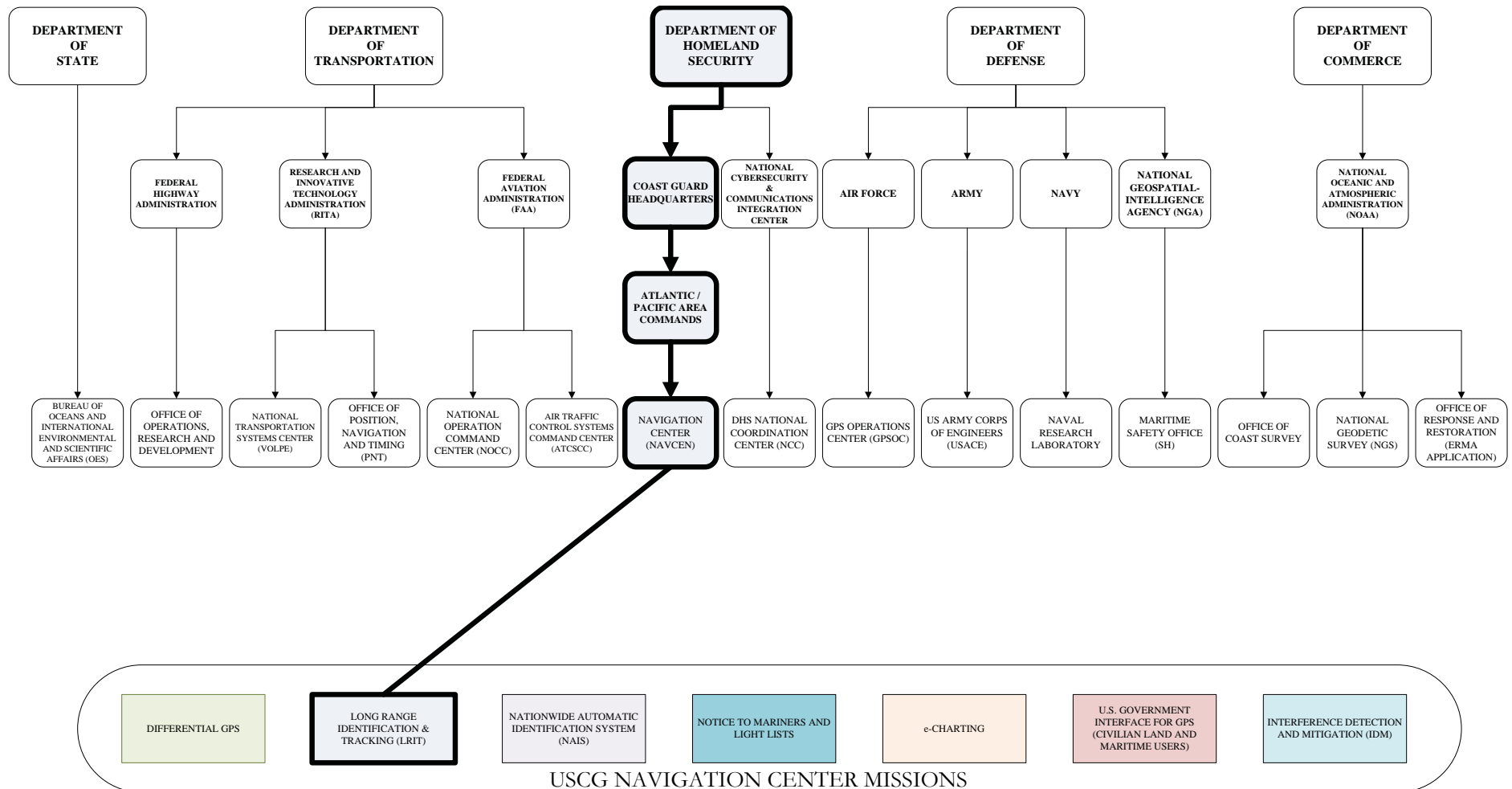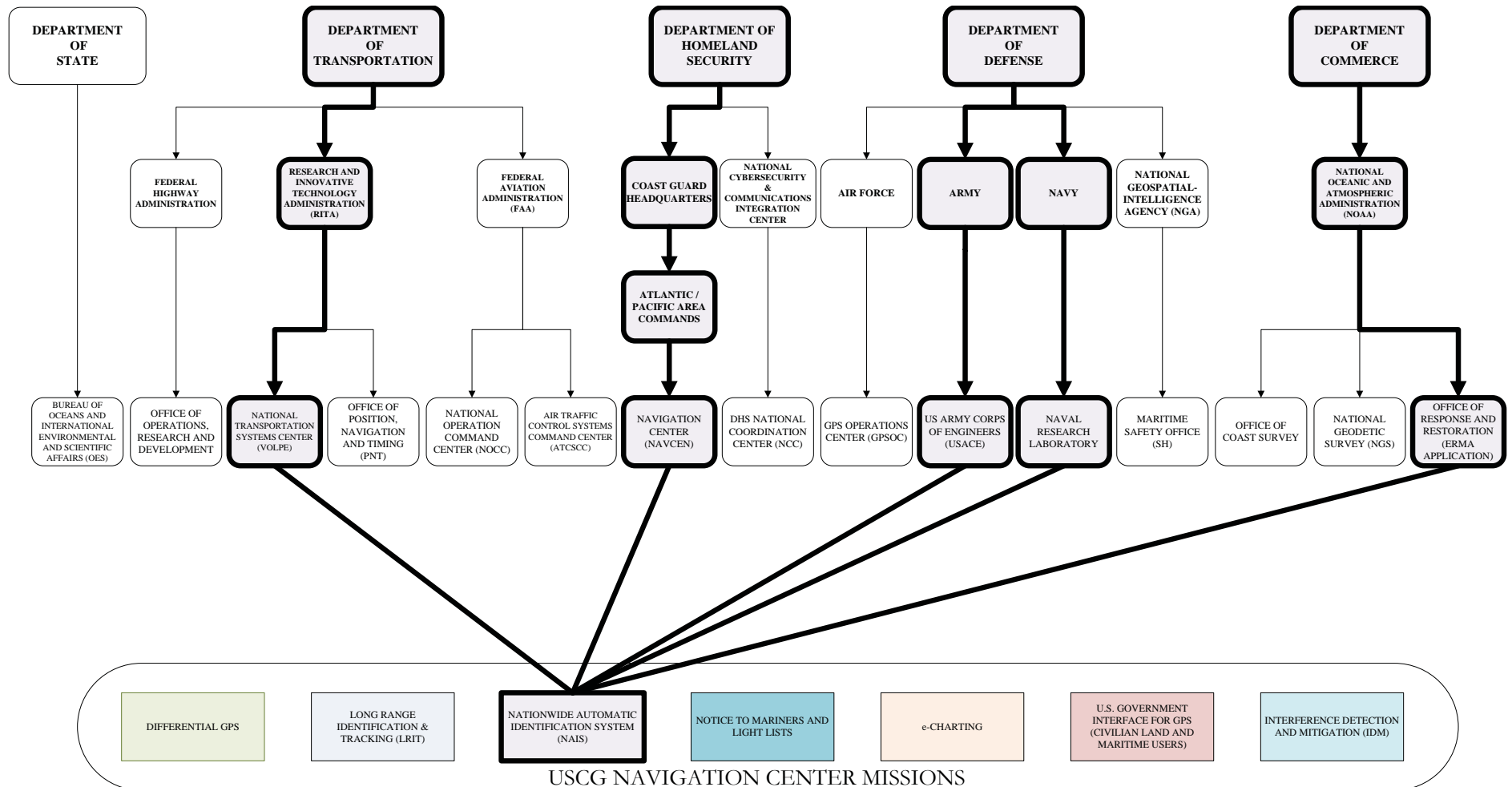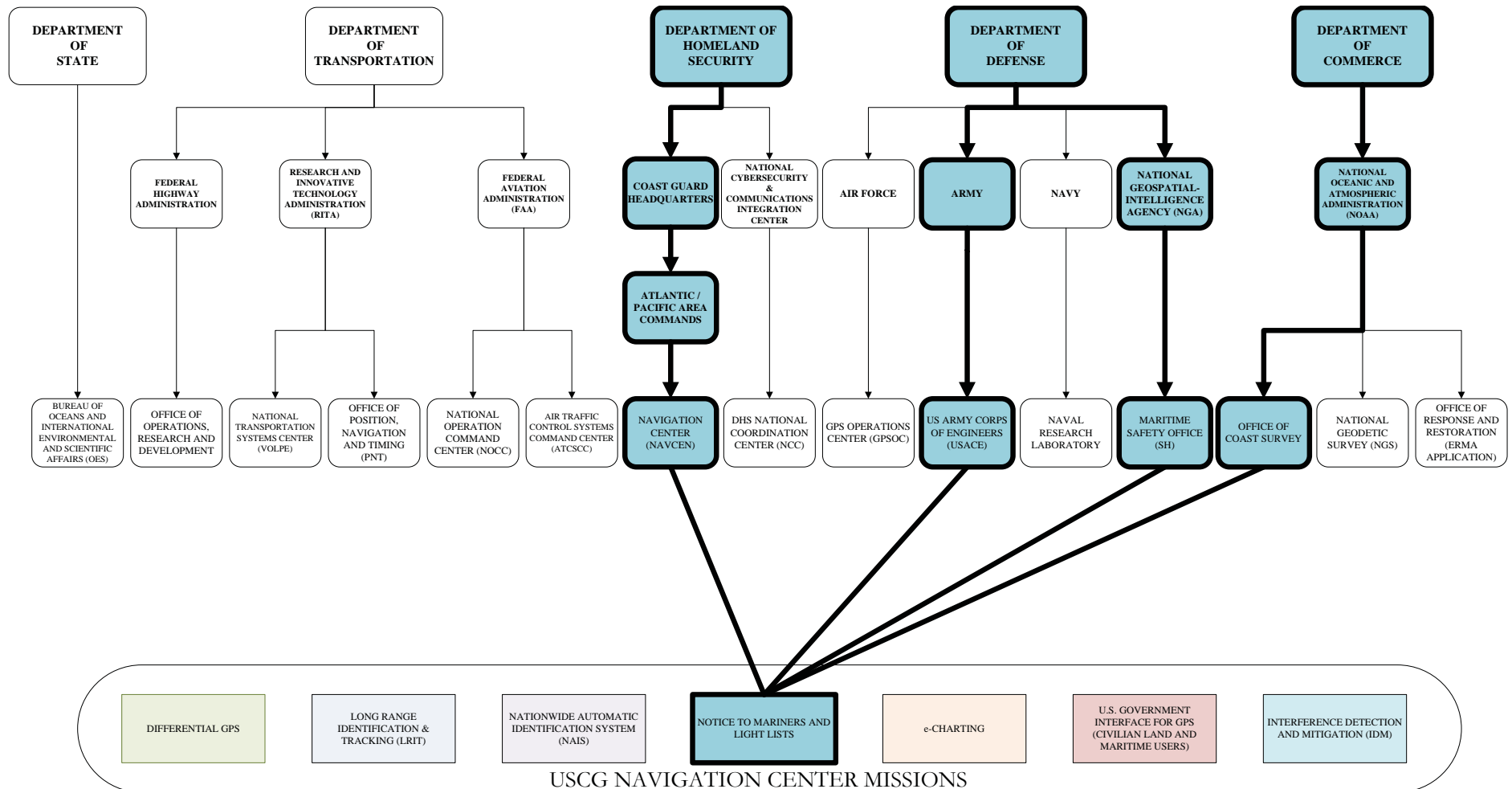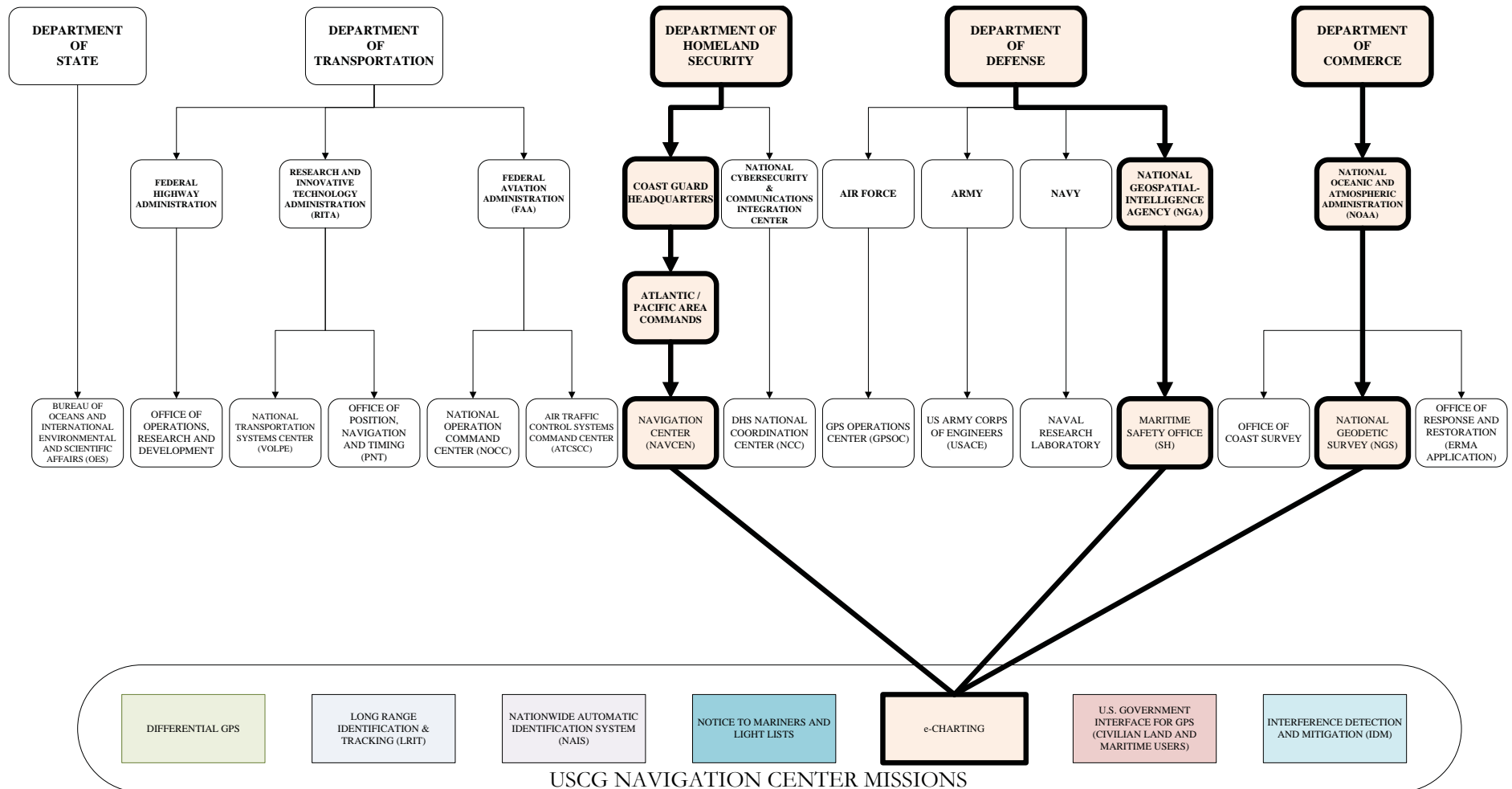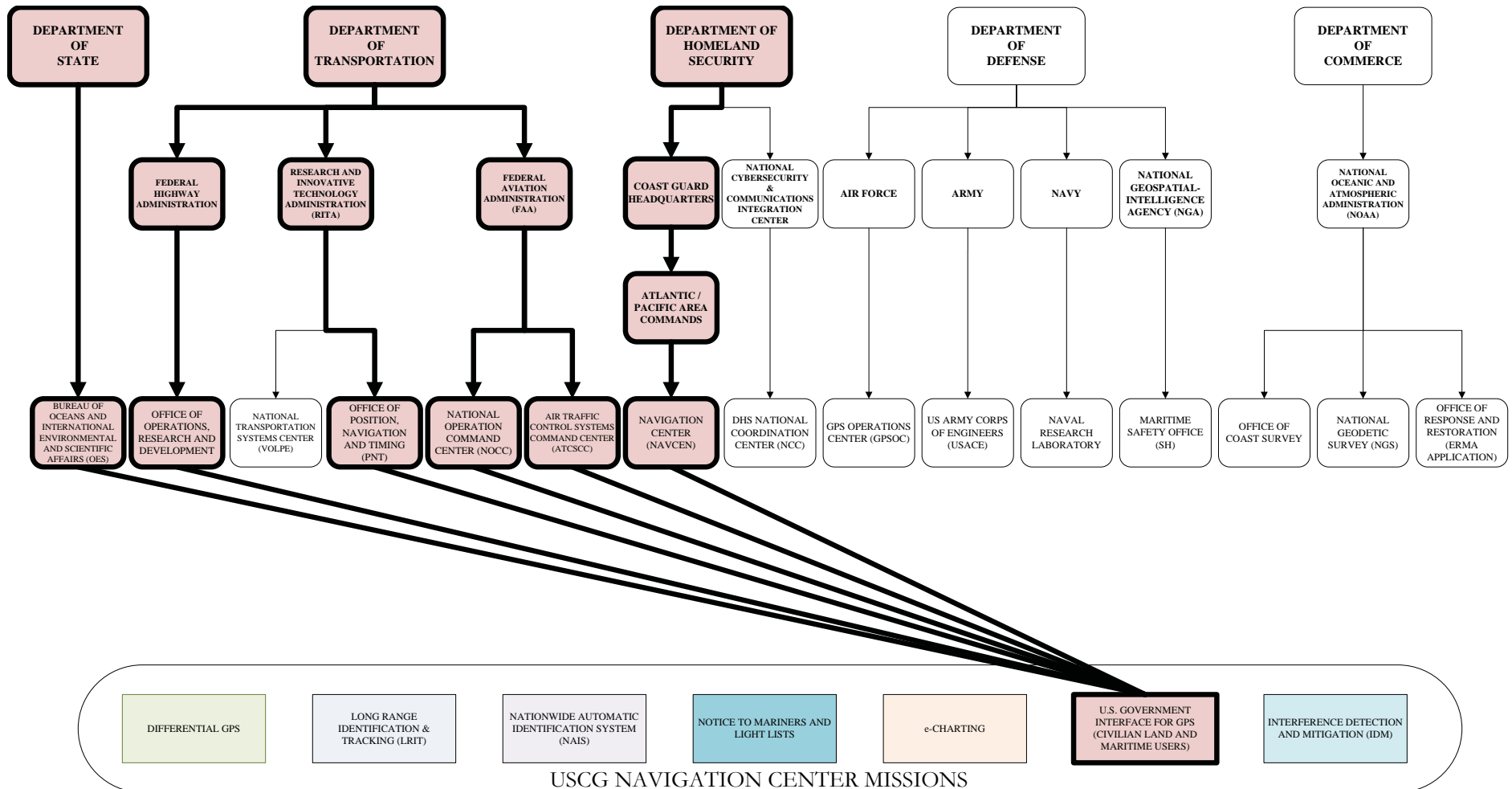U.S. Department of Homeland Security
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NAVIGATION CENTER'S FEDERAL PARTNERS

DEPARTMENT OF STATE	DEPARTMENT OF TRANSPORTATION	DEPARTMENT OF HOMELAND SECURITY	DEPARTMENT OF DEFENSE	DEPARTMENT OF COMMERCE

Level 2:
- FEDERAL HIGHWAY ADMINISTRATION
- RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION (RITA)
- FEDERAL AVIATION ADMINISTRATION (FAA)
- COAST GUARD HEADQUARTERS
- NATIONAL CYBERSECURITY & COMMUNICATIONS INTEGRATION CENTER
- AIR FORCE
- ARMY
- NAVY
- NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY (NGA)
- NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

ATLANTIC / PACIFIC AREA COMMANDS

Level 3:
- BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS (OES)
- OFFICE OF OPERATIONS, RESEARCH AND DEVELOPMENT
- NATIONAL TRANSPORTATION SYSTEMS CENTER (VOLPE)
- OFFICE OF POSITION, NAVIGATION AND TIMING (PNT)
- NATIONAL OPERATION COMMAND CENTER (NOCC)
- AIR TRAFFIC CONTROL SYSTEMS COMMAND CENTER (ATCSCC)
- NAVIGATION CENTER (NAVCEN)
- DHS NATIONAL COORDINATION CENTER (NCC)
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